1. Find \( \frac{dy}{dx} \) if \( 4x^2y - 3y = x^3 - 1 \). (10%)

2. Solve \( \frac{dy}{dx} = \frac{x + 3x^2}{y^2} \). (10%)

3. Evaluate \( \int \int \int_{-2}^{5} \int_{0}^{2} \int_{4}^{x} 4zdydx \). (10%)

4. Find the volume bounded by \( 3x + 6y + 4z - 12 = 0 \), \( xy \)-plane, \( xz \)-plane and, \( yz \)-plane. (10%)

5. Prove that \( \sum_{n=1}^{\infty} (-1)^{n+1} \frac{3^n}{n!} \) converges absolutely. (10%)

6. Find the derivative of \( f(x) = \sin[\cos(x^2)] \). (10%)

7. Find the equation of the tangent line to the curve \( y^3 - xy^2 + \cos xy = 2 \) at the point \( (0,1) \). (10%)

8. Find \( \int x \sin x \, dx \). (10%)

9. Find \( \lim_{x \to 0} \frac{1 - \cos x}{x^2 + x} \). (10%)

10. What is the interval of convergence for \( \sum_{n=0}^{\infty} \frac{(x - 1)^n}{(n + 1)^2} \). (10%)